

See-and-Avoid Collision Avoidance Using ADS-B Signal and Radar Sensing, Phase II

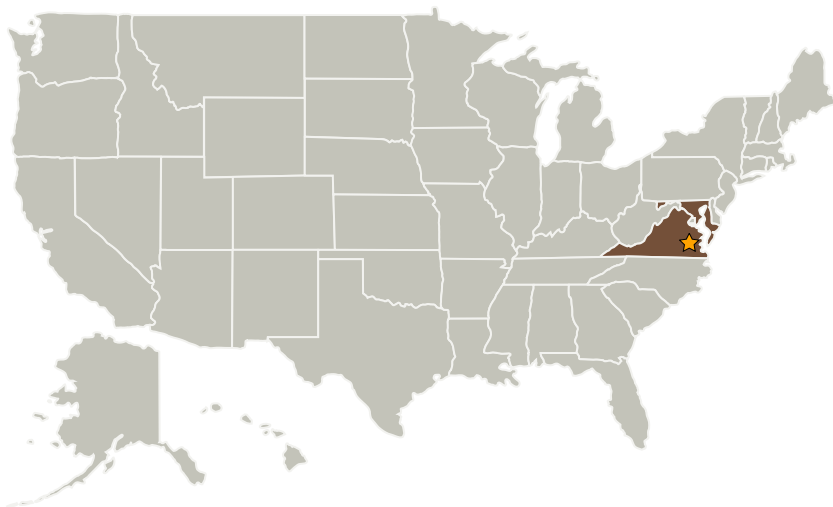
Completed Technology Project (2006 - 2008)



Project Introduction

IAI proposes an innovative collision avoidance radar and communication technology to detect and track both cooperative and non-cooperative targets. The system includes an L-band RF transceiver-sensor package, which continuously transmits Automatic Dependent Surveillance-Broadcast (ADS-B) compatible beacons to alert other cooperative aircraft and ATC (Air Traffic Control) ground stations regarding the aircraft's position and intent. In addition, it uses the reflected beacon signal as a radar signal to detect and track any non-cooperative targets within its effective range. A multifunctional RF transceiver serves as both the primary radar and secondary surveillance radar (SSR). The phase I effort has successfully demonstrated the concept of this technology in three areas: (1) Adding phase modulation to the 1090 ES carrier and proving it still complies with ADS-B waveform standard, (2) Coherent pulse compression for ranging (3) 3D angular estimation using TCAS-like circular antenna array and using innovative digital beamforming and spatial spectrum processing. In the phase II effort, we will work with commercial partners to build a 'brassboard' system and perform a series of system evaluation tests.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Langley Research Center (LaRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★ Langley Research Center(LaRC)	Lead Organization	NASA Center	Hampton, Virginia
Intelligent Automation, Inc.	Supporting Organization	Industry	Rockville, Maryland

Primary U.S. Work Locations

Maryland	Virginia
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Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX02 Flight Computing and Avionics
 - └ TX02.2 Avionics Systems and Subsystems
 - └ TX02.2.2 Aircraft Avionics Systems